

Electro-Chemical Decomposition 115

^f iv. *On some general conditions of Electro-chemical
Decomposition*

404. From the period when electro-chemical decomposition was first effected to the present time, it has been a remark, that those elements which, in the ordinary phenomena of chemical affinity, were the most directly opposed to each other, and combined with the greatest attractive force, were those which were the most readily evolved at the opposite extremities of the decomposing bodies (285).

405. If this result was evident when water was supposed to be essential to, and was present, in almost every case of such decomposition (208), it is far more evident now that it has been shown and proved that water is not necessarily concerned in the phenomena (210), and that other bodies much surpass it in some of the effects supposed to be peculiar to that substance.

406. Water, from its constitution and the nature of its elements, and from its frequent presence in cases of electrolytic action, has hitherto stood foremost in this respect. Though a compound formed by very powerful affinity, it yields up its elements under the influence of a very feeble electric current; and it is doubtful whether a case of electrolysation can occur, where, being present, it is not resolved into its first principles.

407. The various oxides, chlorides, iodides, and salts, which I have shown are decomposable by the electric current when in the liquid state, under the same general law with water (138), illustrate in an equally striking manner the activity, in such decompositions, of elements directly and powerfully opposed to each other by their chemical relations.

408. On the other hand, bodies dependent on weak affinities very rarely give way. Take, for instance, glasses: many of those formed of silica, lime, alkali, and oxide of lead, may be considered as little more than solutions of substances one in another.¹ If bottle-glass be fused, and subjected to the voltaic pile, it does not appear to be at all decomposed (144). If flint glass, which contains substances more directly opposed, be operated upon, it suffers some decomposition; and if borate of

lead glass, which is a definite chemical compound, be experimented with, it readily yields up its elements (144).

409. But the result which is found to be so striking in the instances quoted is not at all borne out by reference to other

¹ *Philosophical Transactions*, 1830, p. 49.